

Tag Data Base for MDC1

Utility of the tag data base

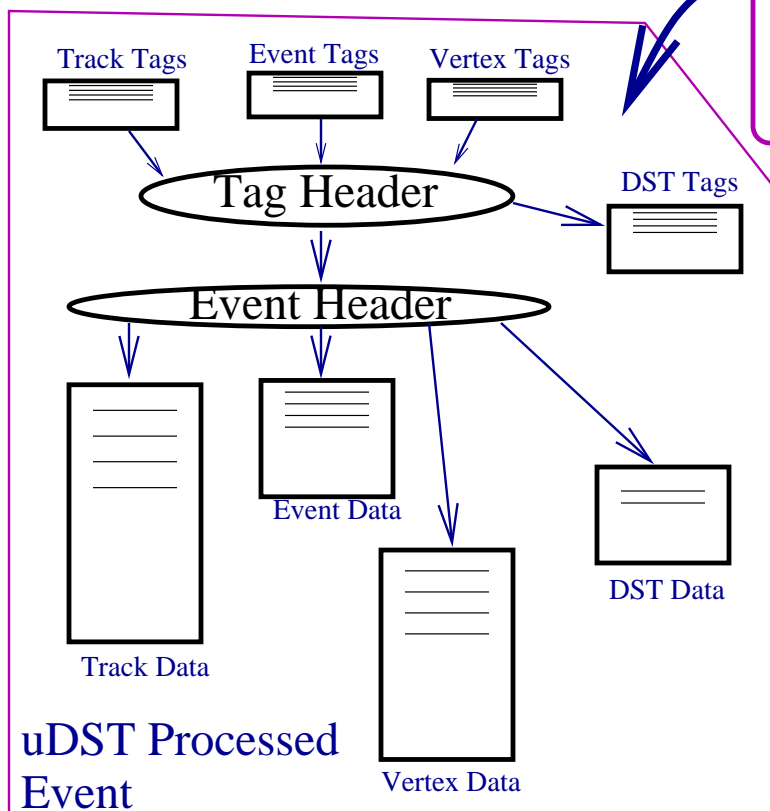
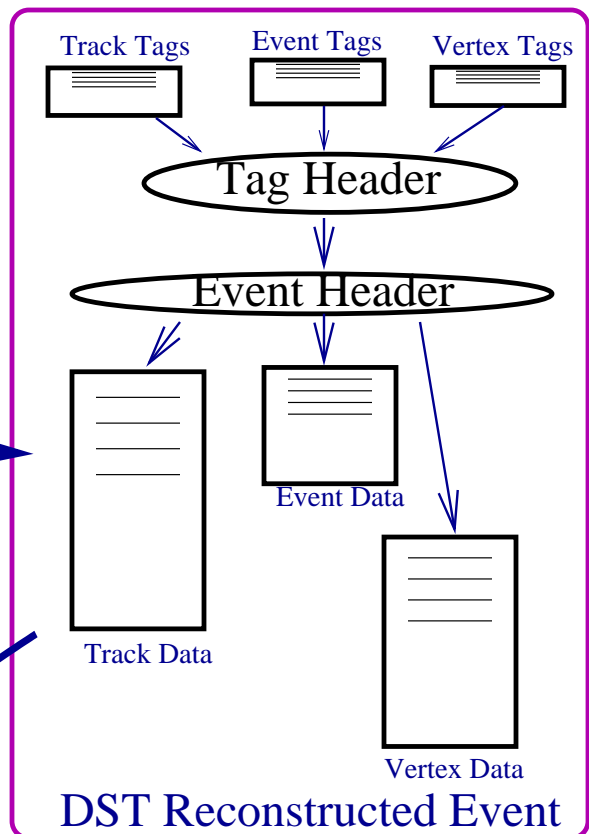
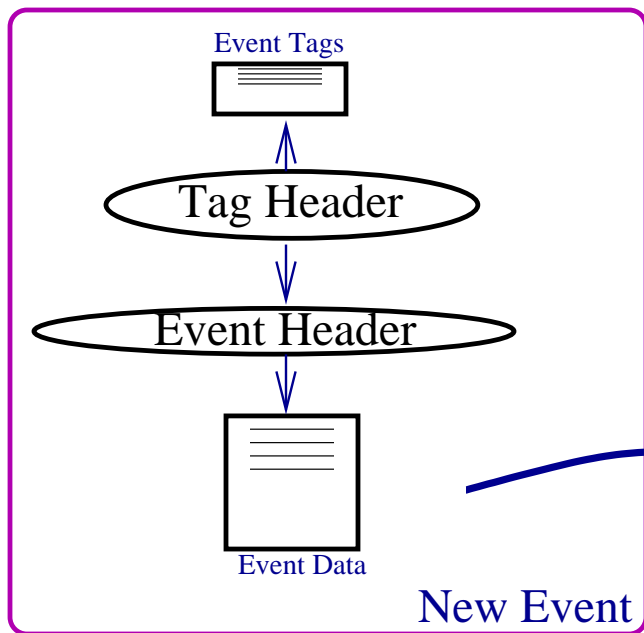
The Tag Data base is a navigation tool for the events in the Star event store.

The Tagdb should be treated a tool for navigation of the events. It must be analyzed in order to understand offline acceptance and efficiency (sometimes known as bias), but should not *necessarily be thought of as an analysis tool itself.

Physics input to the tag data base

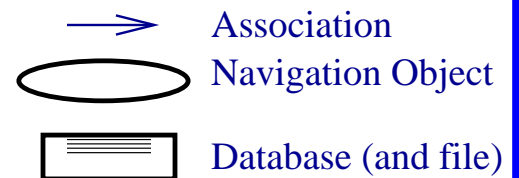
Each Physics working group should supply a list of tags appropriate to the different stages of the analysis process.

The space budgeted for tags is 5KBytes some of this will be occupied by production and global tags.



The tag grows as the event grows through each processing stage

TagDB LifeCycle



The Star Tag Data Base Specifications

Example TagDB structure:

- array of TagDB object references (VArray) hangs off the event header, or the event header has a reference to a TagDB header which internally has the array of TagDB object references
- TagDB components and contents:
 - Raw data:
 - event time
 - event type
 - trigger mask
 - DAQ and online info
 - post-reconstruction (DST):
 - number of tracks (total and good)
 - number of clusters (total and good)
 - number of vertices
 - number of tracks associated with primary vertex
 - charge sum
 - average residuals
 - CPU times
 - total energy
 - mean pt
 - fraction of hits used in tracks
 - mean length of tracks
 - other QA info
 - particle type counts (loose cuts)
 - analysis-level (micro DST):

TagDB will contain physics quantities agreed upon by the analysis groups, currently under discussion

 - Strangeness Tags
 - number of (anti-) protons
 - number of (anti-) Lambdas
 - number of (anti-) Cascades
 - number of neutral K0(S)(L)
 - Event By Event Tags
 - Matrix of SCA variables
 - Collision Axis
 - Peripheral Collision Tags
 - Impact parameter
 - Mean Pt in the event
 - Number of tracks in the forward TPC
 - High Pt group Tags
 - Pt of leading particle 1
 - Pt of leading particle 2
 - Sphericity of the event
 - Rare Particles Tags
 - Pt of candidate
 - Pz of candidate
 - Chi^2 of track reconstruction for candidate

The Star Tag Data Base DDL

```
class StarTag : public ooObj {
public:
// Set Methods for the tag data base
    ooStatus      SetLong (char* TagName, d_Long TagVal) ;
    ooStatus      SetFloat(char* TagName, d_Float TagVal) ;
    ooStatus      SetEvOID() ;
    ooStatus      SetEvRef(ooHandle(oParticles)& oPartH) ;
// Get Methods for the tag data base
    d_Long        GetLong (char* TagName) ;
    d_Float       GetFloat(char* TagName) ;
    EvOID         GetEvOID() ;
    ooStatus      GetEventRef(ooRef(oParticles)& oPartR);
};
class EventTag : public StarTag {
private:
    d_Long _N_Ev;                // Event Number
    d_Long _N_Rn;                // Run Number
    EvOID _EventID;              // Struct for Event ID FD-DB-PG-SL
    d_Short _file_ID;            // file identifier
    //
    ooRef(oParticles) _toEvent_Header;
public:
};
class DAQTag : public StarTag {
private:
    d_Long _TriggerNumber;       // Trigger for which this event readout
    Date _TimeStamp;             // Time at which the event was taken
    d_Long _StatusFlag;          // Long used as bit descriptor for event
    //
public:
    ooRef(EventTag) _toStarTag;
};
class ReconstructionTag : public StarTag {
private:
    d_Long _ReconStatus;          // Status word
    ooRef(EventTag) _toStarTag;
public:
    d_Long      GetTotalStrangeness();
};
class StrangenessTag : public StarTag {
private:
    d_Long _num_Lambda_p;         // Number of Lambda positive
    d_Long _num_Lambda_n;         // Number of Lambda positive
    d_Long _num_Kaon_p;           // Number of positive Kaons
    d_Long _num_Kaon_n;           // Number of negative Kaons
    d_Long _num_proton_p;         // Number of positive protons
    d_Long _num_proton_n;         // Number of negative protons
    ooRef(EventTag) _toStarTag;
public:
    d_Long      GetTotalStrangeness();
    d_Long      GetLambda_P_ratio();
    d_Long      GetLambdaBar_PBar_ratio();
};
```

Adding Tags to Star Events

Copying the tag data base

Groups and individuals will be able to create their own copies of the tag data base which can be used to create personal event lists (collections) as well as new tags for existing tagged events.

Adding Tags to events post production

During MDC1 tags will be to the event store in a controlled fashion in coordination between the tagdb administrator and the PWG leaders.

New tags can be created by associating new tag objects to the Tag Header and/or through adding accessor methods to the existing

Tag Data Base Present Status

In GC integration tests an extremely simple version of the tagdb has been used to exercise the GC architecture.

These databases contain 4-momenta, vertex info and particle IDs for ALL tracks in the event (all mothers and all daughters).

```
TagDataBase{ Run Number
              Event Number
              Number of pi+,pi-,pi0
              Number of Lambda, Lambda-+
              Number of K+, k-
              Total transverse mass in event
              Sum of px, py, pz
              Event Object Identifier
              Event File Identifier }
```

Typical physics quantities which one might use to select events for a given analysis.

eg. Please give me an event list containing only events which have an anomalous ratio of neutral to charge pions from all runs taken with a given detector configuration

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